

IN THE CLAIMS:

1 1. In a network element including a first elemental device and at least a
2 second elemental device, the first and second elemental devices, respectively, connected
3 together by way of a network path and upon which at least selectably to communicate a
4 payload data stream and a management data stream upon a common transport stream, an
5 improvement of apparatus for the first elemental device, said apparatus comprising:

6 a frame encapsulator coupled to receive data to be communicated to the
7 second elemental device, said frame encapsulator for frame-formatting the data into
8 common-transport-stream-related frames; and

9 a communicator coupled to said encapsulator to receive the common-
10 transport-stream related to frames, said communicator utilizing single device-specific
11 MAC (Medium Access Control) addresses for addressing and thereafter transporting the
12 common-transport-stream-related frames upon the network path.

1 2. In the network element of claim 1, a further improvement of apparatus for
2 the second elemental device, said apparatus comprising:

3 a frame analyzer coupled to the network path to receive the common-
4 transport-stream related frames, said frame analyzer for recognizing the single device-
5 specific MAC addresses and for selectably forwarding the common-transport-stream
6 related frames responsive thereto.

1 3. In a network element having a first elemental device and at least a second
2 elemental device, the first and at least second elemental devices, respectively, connected

3 together by a connector, an improvement of apparatus for facilitating communication of
4 data, sourced at a first net entity, at least from the first elemental device to the second
5 elemental device, said apparatus comprising:

6 a frame encapsulator coupled to the first net entity to receive the data to be
7 communicated to the second elemental device, said frame encapsulator for frame-
8 formatting the data into data frames, the data frames having a header portion and a data
9 portion, the header portion selectably including a prefix structure, the prefix structure
10 identifying the first net entity, the data frame, once formed, for communication upon the
11 connector to the second elemental device.

1 4. The apparatus of claim 3 wherein the connector which connects together
2 the first and at least second elemental devices forms an standard compliant Ethernet
3 point-to-point link and wherein the data frames into which said frame encapsulator
4 encapsulates the data comprises Ethernet frames.

1 5. The apparatus of claim 3 wherein the prefix structure included as part of
2 the header portion selectably formed by said frame encapsulator comprises a VLAN
3 (Virtual Local Area Network) Identifier (VID).

1 6. The apparatus of claim 5 wherein the prefix structure is of a length
2 corresponding a VID field defined pursuant to an IEEE 802.1Q standard, and wherein the
3 VID comprises an IEEE 802.1Q-defined VID.

1 7. The apparatus of claim 3 wherein the first elemental device comprises at
2 least a first external port and wherein the first net entity is positioned external to the first
3 elemental device and coupled to the first external port thereof, and wherein the prefix
4 structure identifies the first external port to which the first data source is coupled.

1 8. The apparatus of claim 7 wherein the first elemental device comprises a
2 packet-data interface converter, wherein the first net entity comprises a packet data
3 source, and wherein the prefix structure that identifies the first external port is a
4 configuration parameter.

1 9. The apparatus of claim 7 wherein the first elemental device comprises a
2 Virtual LAN (local area network) processor and wherein said frame encapsulator is
3 embodied at the Virtual LAN processor.

1 10. The apparatus of claim 3 wherein the data sourced at the data source is
2 defined in terms of logical layers, the data formed of at least one lower-level logical layer
3 and at least one higher-level logical layer and wherein the data formatted by said frame
4 encapsulator comprises data formed of the at least one higher-level logical layer.

11. The apparatus of claim 3 wherein the first elemental device comprises an output port, the connector coupled to output port, wherein the second elemental device comprises an input port, the connector coupled to the input port, and wherein the data frames, once formed by said frame encapsulator is provided to the output port of the first elemental device.

12. The apparatus of claim 3 wherein an additional data entity is positioned internal to the first elemental device and wherein the prefix structure of the header portion of the data frame formed by said frame encapsulator remains unpopulated such that the data frame forms a “not tagged” frame.

13. The apparatus of claim 12 further comprising a net entity wherein the first elemental device comprises at least a first external port, wherein the net entity is positioned external to the first elemental device and coupled to the first external port thereof, and wherein the data frame formed by said frame encapsulator is selectably formed of data sourced by the first data source and of data sourced by the second data source.

14. The apparatus of claim 12 wherein the data sourced at the data entity comprises management data and the data sourced at the net entity comprises payload data and wherein the tag header field is populated with the tag header when the data frame is formed of the data sourced by the net entity.

1 15. The apparatus of claim 3 further comprising:
2 a detector positioned at the second elemental device and coupled to
3 receive indications of the data frame communicated from the first elemental device to the
4 second elemental device, said detector for detecting whether the prefix structure is
5 included as part of the header portion.

1 16. The apparatus of claim 15 wherein, when said detector fails to detect the
2 prefix structure to form part of the header portion, the data frame is indicated merely to
3 be received at the first elemental device.

1 17. The apparatus of claim 16 wherein the first elemental device comprises at
2 least a first external port and wherein the first data port is positioned external to the first
3 elemental device and coupled to the first external port thereof, the prefix structure
4 identifying the first external port, and wherein, when said detector detects the prefix
5 structure, said detector further identifies the first data port to be associated with the data
6 frame.

1 18. In a method for communicating at a network element having a first
2 elemental device and at least a second elemental device, the first and at least second
3 elemental devices, respectively, connected together by a connector, an improvement of a
4 method for facilitating communication of data, at least from the first elemental device to
5 the second elemental device, said method comprising:

6 encapsulating the data to be communicated into a data frame, the data
7 frame having a header portion and a data portion; and
8 selectably inserting a prefix structure into the header portion.

1 19. The method of claim 18 further comprising the operations of:
2 communicating the data frame by way of the connector to the second
3 elemental device; and
4 detecting, once the data frame is delivered to the second elemental device,
5 whether the header portion includes the prefix structure.

1 20. The method of claim 18 wherein the prefix structure selectably inserted
2 into the header portion during said operation of selectably inserting comprises a VLAN
3 (Virtual Local Area Network) Identifier (VID).

1 21. The method of claim 20 wherein the prefix structure corresponds to a
2 VID field defined pursuant to an IEEE 802.1Q standard, and wherein the VID comprises
3 an IEEE 802.1Q-defined VID.

1 22. The method of claim 20 wherein the first elemental device comprises at
2 least a first external port and wherein the first data source is positioned external to the
3 first elemental device, coupled to the first external port thereof, said method further
4 comprising the operation of naming the first external port with a first VID, the prefix
5 structure populated with the first VID.